DETAILED ACTION

Response to Amendment

1. This communication is in response to the Amendment filed on 26 February 2010.

2. Claims 13-24 and 26-37 are currently pending. As a result of the Amendment filed 26 February 2010 and the Examiner's Amendment presented below, claims 13-24 and 26-37 (renumbered as 1-24) are allowed.

35 USC § 101 – Clarifications

3. Claims 24 and 37 are directed towards a computer readable storage medium. The examiner construes the storage medium as being limited to statutory embodiments which meet the requirements of a medium under 35 USC 101.

Examiner Amendment

3. Authorization for this examiner's amendment, listed below, was given in a telephone interview with Jennifer Teng (Reg. No. 63,168) on 20 May 2010.

In the Claims:

Please amend claims 14, 22, 23, 27 and 35-37 as follows:

14. (Currently Amended) The method according to claim 13, wherein the winner weight ~~vector~~ for each data point is determined on the basis of the distance between the data point and the weight vectors, and each iteration in the first iterative process further includes calculating a next value for each weight vector on the basis of the current value

of the weight vector and the first neighborhood function of the distance on the lattice structure between the weight vector and the winner weight ~~vector~~, and wherein each iteration in the second iterative process further includes calculating a next value of each of the first coefficients based on: the current value of the each first coefficient, and a combination of a first coefficient of the winner weight ~~vector~~, the second neighborhood function of the distance on the lattice structure between the weight vector and the winner weight ~~vector~~, and an adjustment factor for adjusting convergence speed between iterations.

22. (Currently Amended) The method according to claim 21, further comprising: estimating an upper limit K for a number of clusters in the self-organizing map; defining a coefficient vector $\Theta i = (\Theta i,1, \Theta i,2, \ldots \Theta i, K)$ for each weight vector i in the self-organizing map, the coefficient vector comprising K second coefficients $\Theta i,1$, each of which represents a weighting between the weight vector i and a label l; and assigning cluster label l to weight vector i if: $l = \arg\max \Theta i,k, 1 \leq k \leq K$.

23. (Currently Amended) The method according to claim 22, wherein each iteration in the second iterative process comprises calculating a next value of each second coefficient based on the current value of the second coefficient and a combination of a coefficient of the winner weight ~~vector~~, a third neighborhood function of distance, and an adjustment factor for adjusting convergence speed between iterations.

27. (Currently Amended) The apparatus of claim 26, wherein the apparatus is further caused to: determine the winner weight ~~vector~~ for each data point on the basis of the distance between the data point and the weight vectors; calculate a next value for each

weight vector on the basis of the current value of the weight vector and the first neighborhood function of the distance on the lattice structure between the weight vector and the winner weight ~~vector~~; and calculate a next value of each of the first coefficients based on: the current value of the each first coefficient, and a combination of a first coefficient of the winner weight ~~vector~~, the second neighborhood function of the distance on the lattice structure between the weight vector and the winner weight ~~vector~~, and an adjustment factor for adjusting convergence speed between iterations..

35. (Currently Amended) The apparatus of claim 27, wherein the apparatus is further caused to: estimate an upper limit K for a number of clusters in the self-organizing map; define a coefficient vector $\Theta i = (\Theta i,1, \Theta i,2, \ldots \Theta i, K)$ for each weight vector i in the self-organizing map, the coefficient vector comprising K second coefficients $\Theta i,1$, each of which represents a weighting between the weight vector i and a label l; and assign cluster label l to weight vector i if: $l = \arg\max \Theta i,k$, $1 \leq k \leq K$.

36. (Currently Amended) The apparatus of claim 27, wherein the wherein the apparatus is further caused in each iteration in the second iterative process to calculate a next value of each second coefficient based on the current value of the second coefficient and a combination of a coefficient of the winner weight ~~vector~~, a third neighborhood function of distance, and an adjustment factor for adjusting convergence speed between iterations.

37. (Currently Amended) A computer-readable storage medium according to claim 24, wherein the winner weight ~~vector~~ for each data point is determined on the basis of the distance between the data point and the weight vectors, and each iteration in the first

iterative process further includes calculating a next value for each weight vector on the basis of the current value of the weight vector and the first neighborhood function of the distance on the lattice structure between the weight vector and the winner weight ~~vector~~, and wherein each iteration in the second iterative process further includes calculating a next value of each of the first coefficients based on: the current value of the each first coefficient, and a combination of a first coefficient of the winner weight ~~vector~~, the second neighborhood function of the distance on the lattice structure between the weight vector and the winner weight ~~vector~~, and an adjustment factor for adjusting convergence speed between iterations.

Reasons for Allowance

4. The following is an examiner's statement of reasons for allowance:

In the Examiner's Non-Final Office Action dated 27 November 2010, claims 13-20 and 24-33 were rejected under 35 USC 103 based primarily on US Patent No 6,2226,408 to Sirosh and US Patent No 6,260,036 to Almasi et al and claims 21-23 and 34-36 were rejected under 35 USC 103 based primarily on US Patent No 6,2226,408 to Sirosh, US Patent No 6,260,036 to Almasi et al and US Patent No 5,809,490 to Guiver et al.

The claimed invention is directed towards determining cluster centers through the utilization of a first data structure, a first process, a first neighborhood function, a second structure, a second process and a second neighborhood function.

The prior art of record, Sirosh, Almasi and Guiver, do not show, teach or suggest

the combined limitations of **performing, by the apparatus, a first iterative process with iterations each including determining a winner weight for each data point and then updating each weight vector corresponding to the winner weight with a first neighborhood function and a corresponding first coefficient updated in a second iterative process such that the weight vectors move toward the cluster centers; performing, by the apparatus, the second iterative process with iterations each including updating said corresponding first coefficient in a second data structure by utilizing a second neighborhood function and the winner weight determined in the first iterative process; wherein the first coefficient is limited to a range [0,1], the first neighborhood function gives only positive values, and the second neighborhood function gives negative values in a distance range between 0 and 1**, in combination with the other claimed features.

Referring to Applicant's arguments on pages 13-14 of the Remarks filed 26 February 2010, the Applicant states "In stating the rejection, the Examiner asserted that one having ordinary skill in the art would have been led to modify Sirosh's multidimensional data clustering system by including Almasi's mechanism of interleaving of a first process with a second process via updating a first coefficient to increase system efficiency via learning. Applicant respectfully traverses this rejection." Applicant's arguments have been fully considered and are persuasive. Therefore, the rejections of the claims have been withdrawn.

An updated search for prior art on the EAST database and on domains (NPL-Google and ACM) has been conducted. The prior art searched and investigated in the

database and domains does not fairly teach or suggest the teaching of the claimed subject matter as described above and reflected by the combined elements in independent claims 13, 24 and 26. Dependent claims 14-23 and 27-37 are indicated as being allowable for the same reasons stated above in regards to the independent claim.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY LOVEL whose telephone number is (571)272-2750. The examiner can normally be reached on 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on (571) 272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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11 May 2010